What is claimed is:

1. Apparatus for illuminating the fundus of an eye with a scanned sample beam of radiation, the scanned sample beam emerging from a beam scanner which is exposed to a sample beam, which apparatus comprises:

means for transferring radiation from the scanned sample beam, including chief rays of the sample beam which emerge from a point of final deflection of the beam scanner; and

means for focusing the transferred radiation so that the scanned sample beam is focused onto the fundus by the eye;

wherein the means for transferring comprises a lens means which is fixed with respect to the beam scanner so that the point of final deflection is located substantially in the back focal plane of the lens means and wherein the lens means is movable.

2. The apparatus of claim 1 wherein the means for focusing comprises an ocular lens of a fundus camera.

3. The apparatus of claim 2 wherein the means for transferring further comprises a beamsplitter disposed to direct output from the lens means to the ocular lens.

4. The apparatus of claim 3 which further comprises a compensation plate disposed in the fundus camera to compensate for shifting of an optical axis of the fundus camera by the beamsplitter.

5. Apparatus for illuminating the fundus of an eye with a scanned sample beam of radiation, the scanned sample beam emerging from a beam scanner which is exposed to a sample beam, which apparatus comprises:

means for transferring radiation from the scanned sample beam, including chief rays of the sample beam which emerge from a point of final deflection of the beam scanner; and

means for focusing the transferred radiation so that the scanned sample beam is focused onto the fundus by the eye;

wherein the means for transferring is fixed with respect to the beam scanner and at least a first portion of the focusing means so that the point of final deflection is located substantially in the back focal plane of the first portion of the focusing means and wherein the first portion of the focusing means is movable.

6. The apparatus of claim 5 wherein the first portion of the means for focusing comprises an internal focusing lens of a fundus camera.

7. The apparatus of claim 6 wherein the means for transferring comprises a beamsplitter disposed to direct the scanned sample beam to impinge upon the internal focusing lens.

8. The apparatus of claim 6 which further comprises light stop means disposed in an illumination path of the fundus camera to provide a hollow cone of illumination radiation which impinges upon an ocular lens of the fundus

camera.

9. The apparatus of claim 2 which further comprises light stop means disposed in an illumination path of the fundus camera to provide a hollow cone of illumination radiation which impinges upon an ocular lens of the fundus camera.

10. The apparatus of claim 6 which further comprises linearly polarizing means disposed in an illumination path of the fundus camera to substantially linearly polarize radiation in an illumination beam and linearly polarizing means disposed in an observation path of the fundus camera, a direction of its linear polarization being substantially orthogonal to a direction of linear polarization of the means disposed in the illumination means.

Cont. A4

11. The apparatus of claim 2 which further comprises linearly polarizing means disposed in an illumination path of the fundus camera to substantially linearly polarize radiation in an illumination beam and linearly polarizing means disposed in an observation path of the fundus camera, a direction of its linear polarization being substantially orthogonal to a direction of linear polarization of the means disposed in the illumination means.

12. The apparatus of claim 6 which further comprises means for disposing a fixation target in an intermediate image of the fundus which is formed behind the ocular lens in an illumination path of the fundus camera.

13. The apparatus of claim 2 which further comprises means for disposing a fixation target in an intermediate image of the fundus which is formed behind the

ocular lens in an illumination path of the fundus camera.

Cont'd A4

14. The apparatus of claim 6 which further comprises means for disposing a visible light source in an image plane of a video port of the fundus camera, the visible light source being movable.

15. Apparatus for use in optical coherence tomography which includes a Doppler shifter, the Doppler shifter comprising:

means for splitting a beam into a reference beam and a sample beam;

a rotatable, refractive, light transmissive block, the block having four substantially equal length sides formed into a square;

means for rotating the block;

means for directing the reference beam to impinge on the block in a reference direction and means for directing the sample beam to impinge upon the block in a sample direction, the reference direction and the sample direction being disposed substantially at a 45 degree angle with respect to each other; and

a first and a second reflecting means disposed behind the block to reflect the reference beam and the sample beam emerging therethrough back through the block.

Sub A5

16. Method for illuminating the fundus of an eye with a scanned sample beam of radiation, the scanned sample beam emerging from a beam scanner which is exposed to a

sample beam, which method comprises the steps of:

transferring radiation from the scanned sample beam, including chief rays of the sample beam which emerge from a point of final deflection of the beam scanner; and

focusing the transferred radiation so that the scanned sample beam is focused onto the fundus by the eye;

wherein the step of transferring comprises transferring with a movable lens which is fixed with respect to the beam scanner so that the point of final deflection is located substantially in the back focal plane of the lens.

17. Method for illuminating the fundus of an eye with a scanned sample beam of radiation, the scanned sample beam emerging from a beam scanner which is exposed to a sample beam, which apparatus comprises:

transferring radiation from the scanned sample beam, including chief rays of the sample beam which emerge from a point of final deflection of the beam scanner; and

focusing the transferred radiation so that the scanned sample beam is focused onto the fundus by the eye;

wherein the step of transferring comprises transferring with a beamsplitter which is fixed with respect to the beam scanner and a movable focusing lens so that the point of final deflection is located substantially in the back focal plane of the focusing lens.